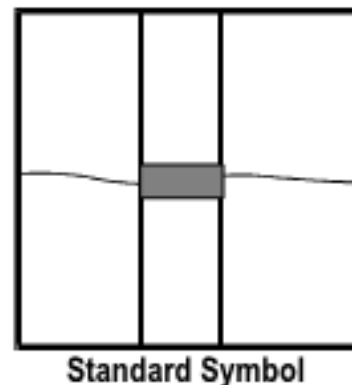


NS-4 TEMPORARY STREAM CROSSING

Refer to: ITD Standard Specifications, Section 602.



Definition and Purpose

A temporary stream crossing (a bridge or culvert) provides a means for construction vehicles to cross streams or watercourses without damaging the streambed or channel and protects the stream bank from further degradation and sediment loss.

Appropriate Applications

Temporary stream crossings are installed at sites:

- When it is necessary to cross a stream and a permanent crossing is not feasible or not yet constructed.
- When heavy equipment must be moved from one side of a stream channel to another.
- Where light-duty construction vehicles have to cross the stream channel frequently for a short period.
- When crossing perennial streams or watercourses causes significant erosion.
- Where construction activities will not last longer than 1 year.

The specific loads and the stream conditions will dictate which of the following types of stream crossing to employ.

- **Bridge:** Bridges are appropriate for streams with high flow velocities, steep gradients, and/or where temporary restrictions in the channel are not allowed. Where conditions are adequate, bridges are the preferred method to cross a stream. A bridge provides the least disturbance or obstruction to flows and fish migration. Old flatbed rail cars in some instances can be used effectively to bridge a stream.

BMP Objectives

- ☐ Perimeter Control
- ☐ Slope Protection
- ☐ Borrow and Stockpiles
- ☐ Drainage Areas
- ☐ Sediment Trapping
- ☒ Stream Protection
- ☐ Temporary Stabilizing
- ☐ Permanent Stabilizing

- **Culvert:** A culvert may be used on perennial intermittent streams, where conditions are not adequate for bridges.
- **Fords:** Fords are appropriate during the dry season in arid areas. Used on dry washes and ephemeral streams, as well as low-flow perennial streams. Cellular Confinement System (CCS), a type of ford crossing, is also appropriate for use in streams.

Limitations

- Temporary stream crossings are a direct source of pollution and every effort should be made to use an alternate method, such as a detour.
- A bridge is expensive to design and install and may be difficult to justify for a temporary crossing. Culverts cause greater disturbance during installation and removal. In sensitive stream systems, the disturbance impact may be prohibitive. When it is necessary to cross a stream, a well-planned approach will minimize damage to the stream bank and reduce erosion.
- The use of stream crossing measures below the high water mark of a stream or other water body (waters of the U.S.) should be carefully evaluated due to Section 404 permit requirements. A U.S. Corps of Engineers Section 404 permitting would be required. A 401 Water Quality Certification and an Idaho Department of Water Resources Stream Alteration Permit may be required. Both are issued by the Department of Water Resources.
- If numerical-based water quality standards (WQS) are mentioned in associated permits or certifications, testing and sampling may be required. If monitoring related to these numerical-based WQS is not addressed in the contract documents, contact the Engineer.
- Installation may require dewatering or temporary diversion of the stream. See NS-2 (Dewatering Operations) and NS-5 (Clear Water Diversion).
- Stream crossings may become a constriction in the waterway, which can obstruct flood flow and cause flow backups or washouts. If improperly designed, flow backups can increase the pollutant load through washouts and scouring.
- Fording a stream by placing gravel or rock in the bottom of the streambed is **unacceptable**, except for less sensitive or intermittent streams where this procedure would be the least disruptive to streambed and stream bank.
- Use of natural or other gravel in the stream for construction of CCS ford crossing will be contingent upon approval by fisheries agencies.
- CCS should not be used in exclusively high or fast flows.
- Upon completion of construction activities, CCS blocks must be removed from stream.

General Considerations

Stream crossing designs must be adapted for each application. Location of temporary stream crossing shall address:

- Site selection where erosion potential is low.

- Areas where the side slopes from highway runoff will not split into the side slopes of the crossing.

Design and installation will comply with the following guidelines:

- Knowledge of stream flows and soil strength is required.
- Designs shall be prepared under direction of, and approval by, a registered civil and/or structural engineer.
- The stability in the crossing and adjacent areas to withstand the design flow will be provided.
- Surface treatments such as oil or other potentially hazardous waste materials will be avoided.

Construction Considerations

- Construction roadways, adjacent work area, and stream bottoms shall be stabilized against erosion.
- Construction will occur during dry periods to minimize stream disturbance and reduce costs.
- Construction will occur at or near the natural elevation of the stream bed to prevent potential flooding upstream of the crossing.
- Temporary sediment control BMPs will be installed in accordance with sediment control BMPs presented in Chapter 3 to minimize erosion of embankment into flow lines.
- Vehicles and equipment shall not be driven, operated, fueled, cleaned, maintained, or stored in the wet or dry portions of a water body where wetland vegetation, riparian vegetation, or aquatic organisms may be destroyed, except as authorized by an Engineer, as necessary to complete the work.
- Temporary water body crossings and encroachments shall be constructed to minimize scour. Cobbles used for temporary water body crossings or encroachments shall be clean, rounded river cobble.
- The exterior of vehicles and equipment that will encroach on the water body within the project shall be maintained free of grease, oil, fuel, and residues.
- Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. Precautions shall be taken to avoid damage to vegetation by people or equipment. Disturbed vegetation shall be replaced with the appropriate soil stabilization measures.
- Riparian vegetation, when removed pursuant to the provisions of the work, shall be cut off no lower than ground level to promote rapid re-growth.
- Access roads and work areas built over riparian vegetation shall be covered by a sufficient layer of clean river run cobble to prevent damage to the underlying soil and root structure. The cobble shall be removed upon completion of project activities.

- Any temporary artificial obstruction placed within flowing water shall only be built from material, such as clean gravel, that will cause little or no siltation.
- Drip pans shall be placed under all vehicles and equipment placed on docks, barges, or other structures over water bodies when the vehicle or equipment is planned to be idle for more than 1 hour.
- Conceptual temporary stream crossings are shown in figures at the end of this section.
- Project plans should contain specific construction requirements. Make field adjustments as necessary to ensure proper performance.

Specific Considerations

- Culverts are relatively easy to construct and able to support heavy equipment loads.
- Fords have the maximum load limits; therefore, they are the least expensive of the crossing structures.
- Temporary fords are not appropriate if construction will continue through the rainy season, if thunderstorms are likely, or if the stream is perennial.
- CCS crossing structures consist of clean, washed gravel and CCS blocks. CCS are appropriate for streams that would benefit from an influx of gravel; for example, salmonid streams, streams or rivers below reservoirs, as well as urban, channelized streams. Many urban stream systems are gravel-deprived due to human influences, such as dams, gravel mines, and concrete channels.
- CCS allow designers to use either angular or naturally-occurring, rounded gravel, because the cells provide the necessary structure and stability. In fact, natural gravel is optimal for this technique, because of the habitat improvement it will provide after removal of the CCS.
- A gravel depth of 2 to 12 inches for a CCS structure is sufficient to support most construction equipment.
- An advantage of a CCS crossing structure is that relatively little rock or gravel is needed, because the CCS provides the stability.
- Bridges are generally more expensive to design and construct, but provides the least disturbance of the stream bed and constriction of the waterway flows.

Maintenance and Inspection

- Inspections shall be conducted as required by the NPDES permit or contract specifications.
- Maintenance provisions shall include:
 - Periodic removal of debris behind fords, in culverts, and under bridges.
 - Replacement of lost protective aggregate from inlets and outlets of culverts.
 - Removal of temporary crossing promptly when it is no longer needed.

- Corrections will be made based on the NPDES Permit inspections. If erosion or undermining of the structure occurs, take corrective action immediately.
- Upon removal of the stream crossing, the stream bank and streambed will be stabilized and the site will be returned to as near-natural condition as possible. Some form of rock riprap and permanent revegetation may be required if the stream bank has been disturbed.